Revolutions in Photo Technology

- Painting: ca. 60,000 years old
- Woodcut: 400 BC
- Camera obscura: 1800
- Film photography: 1876
- Polaroid: 1947
- Digital: 1991
Revolutions in Picture Technology for Security Documents

Signature
450 BC

Real Picture
c. 1900

Photographic process
c. 1950

Inkjet printing
c. 1985

Dye-sublimation / Thermal transfer printing

High secure Grayscale laser picture

High secure Color picture
Personalization Technologies
MB Color Family

- **MB D2T2 Picture**
- **MB Alfresco Picture**
- **MB Embedded Picture**
MB D2T2 Picture
MB D2T2 Picture
Color Picture Solution

Protective adhesive layer
MB D2T2 Picture on card surface
Laser engraving
Blank card
MB D2T2 Picture

- Raw material supply
- Pre-Press/Printing
- Punching
- Sheet collating and lamination
- Inspection
- Laser Personalization
- Protective adhesive layer
- MB D2T2 Picture
MB D2T2 Picture
Color Picture Solution

- Perfect for decentralized infrastructure
- High resolution color picture (600 dpi)
- Color picture combined laser engraving
MB Alfresco Picture
MB Alfresco Picture
Color Picture Solution

Protective adhesive layer

MB Alfresco Picture on card surface

Laser engraving

Blank card
MB Alfresco Picture

Raw material supply

Pre-Press/Printing

Punching

Sheet collating and lamination

Inspection

Laser Personalization

Protective adhesive layer

MB Alfresco Picture
MB Alfresco Picture
Color Picture Solution

- Highest durability
- Perfect light fastness
- High resolution color picture (1440 dpi)
- Color picture combined laser engraving
- Lifetime of more than 10 years*

* Lifetime indications depending on intended use
MB Alfresco Picture
Qualified Card Service Lifetime

The MB Alfresco Picture has successfully passed the Card Service Lifetime tests for 10 years according to ISO 24789

Proved by an independent laboratory according ISO standards
Embedded Picture Sheet

Document is pre-personalized with holders picture and document number on the core body printing sheet.
MB Embedded Picture
High Resolution Color Picture Inside the Document Body
MB Embedded Picture
High Resolution Color Picture Inside the Document Body

Pre-Press / Printing

Pre-Personalization

Raw material supply

Sheet collating and lamination

Laser Personalization

Inspection

Punching

MB Embedded Picture Color

Pre-Personalization

High Resolution Color Picture Inside the Document Body
Embedded Picture
Advantages and Benefits

- High resolution color picture (1440 dpi)
- Color picture integrated into the card body
- No blank documents
- Latest polymere document materials
- Lifetime of more than 10 years
Embedded Picture
Internal and External Qualification

- **Surface Abrasion**: 1000 cycles / 3000 cycles
- **Bending**: 1000 cycles / 8000 cycles
- **Torsion**: 1000 cycles / 6000 cycles
- **Delamination**: 3.5 N / > 7N
- **Light fastness**: BWS 3 / BWS 5
Embedded Picture

References

National identity document projects for Bosnia and Herzegovina

First national wide ID document project including national eID card, drivers license and passport with polycarbonate datapage utilizing the embedded picture technology.
Color Meets Laser
Personalization Technologies
MB Color Family Meets Laser

Laser engraving
Color image
Blank document
Conclusion
## MB Color Family Comparison

<table>
<thead>
<tr>
<th></th>
<th>MB D2T2 Picture</th>
<th>MB Alfresco Picture</th>
<th>MB Embedded Picture</th>
<th>Retransfer Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Durability</strong></td>
<td>Up to 5+ years</td>
<td>Up to 10+ years</td>
<td>Up to 10+ years</td>
<td>Up to 5+ years</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>Up to 600 dpi</td>
<td>Up to 1440 dpi</td>
<td>Up to 1440 dpi</td>
<td>Up to 600 dpi</td>
</tr>
<tr>
<td><strong>Forensic details</strong></td>
<td>★★</td>
<td>★★★</td>
<td>★★★</td>
<td>★★</td>
</tr>
<tr>
<td><strong>Card Material</strong></td>
<td>PVC, TeCoLas®, others*</td>
<td>PC, PVC, TeCoLas®, others*</td>
<td>PC, PVC, TeCoLas®, others*</td>
<td>PC, PVC, TeCoLas®, others*</td>
</tr>
<tr>
<td><strong>Consumables costs per card</strong></td>
<td>$$</td>
<td>$</td>
<td>$</td>
<td>$$$</td>
</tr>
<tr>
<td><strong>Personalization Infrastructure</strong></td>
<td>Centralized, Decentralized</td>
<td>Centralized, Decentralized</td>
<td>Centralized</td>
<td>Centralized, Decentralized</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>★★</td>
<td>★★★</td>
<td>★★★</td>
<td>★</td>
</tr>
</tbody>
</table>

*on clients request
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